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TAXONOMIC OVERVIEW OF THE MEXICAN SPECIES OF *SALVIA* SECT. *FLOCCULOSAE* (LAMIACEAE)

BILLIE L. TURNER
Plant Resources Center
The University of Texas
Austin, Texas 78712

ABSTRACT

Epling (1939) delimited Salvia sect. *Flocculosae* as largely a Mexican taxon composed of 19 species, 10 confined to Mexico and closely adjacent USA. Two additional taxa, **Salvia venturana** B.L. Turner, **sp. nov.**, from Puebla, and **S. jessicae** B.L. Turner, **sp. nov.**, from Coahuila, are added to the complex in the present account, the latter a well-marked gypsophile. *Salvia chamaedryoides* var. *isochroma* is treated here at specific rank as **Salvia isochroma** (Fern.) B.L. Turner, **comb. et stat. nov.** Photographs of the newly ordained types are provided, along with maps showing the distribution of the Mexican species of the complex.

KEY WORDS: Lamiaceae, *Salvia* sect. *Flocculosae*, gypsophily, Mexico

In Epling's account (1939), *Salvia* sect. *Flocculosae* (Epling) Epling accommodated 18 taxa, 10 from Mexico, 2 from the Dominican Republic, and 5 from South America (including the type species of the section), all having the attributes in the description below. Most noteworthy are those taxa possessing floccose (tufted or branched) hairs, which gives the section its name. The present paper considers only the Mexican species and adds 3 species, two newly described and one raised from varietal rank.

Perennial, suffruticose herbs or shrublets, 20–80 cm high. Stems pubescent with branched hairs or not. Leaf blades ovate to deltoid-elliptic, 6–30 mm long, 4–10 mm wide. Spikes interrupted, 5–10 cm long. Floral bracts, lanceolate to ovate, soon deciduous. Calyces (flowering) 5–8 mm long, the upper lip 5–7 veined, pubescent with branched hairs (rarely not). Corolla tubes blue, purple, rose or red, 5–15 mm long; upper lips 3–5 mm long. Stylar shaft flattened, pilose apically, the upper branches 2–4 times as long as the lower.

Type species: *S. flocculosa* Benth. (non *S. collina* Salisb.)

KEY TO THE SPECIES

1. Corollas rose-colored to red.

   2. Pubescence of mostly branched hairs; leaves markedly rugose above, the margins crenulate ..... **Salvia venturana**
   2. Pubescence of mostly simple hairs; leaves smooth above, markedly glandular-punctate, the margins entire ..... **Salvia greggii**

1. Corollas blue to purple.

   3. Plants of Baja California Sur ..... **Salvia cedroensis**
   3. Plants elsewhere.

      4. Calyx pubescent with glandular trichomes to 0.3 mm long; leaf blades 1 cm long or less; Pue, Oax ..... **Salvia thymoides**
      4. Calyx not pubescent as described above; leaf blades mostly 1 cm long or more.

5. Stems recumbent; leaf blades broadly oval, 1.0–1.5 times as long as wide; Coa ..... **Salvia chionophylla**
5. Stems stiffly erect; leaves variously ovate to elliptic, 2–3 times as long as wide.

6. Stems and foliage pubescent with mostly simple hairs, rarely some of the hairs with 2–3 branches.

7. Leaves mostly 5–12 mm long; San ..... **Salvia serpyllifolia**
7. Leaves mostly 12–30 mm long.

8. Corolla tubes ca 15 mm long; Coa, Nue, Dur ..... **Salvia muelleri**
8. Corolla tubes 8–12 mm long; Chi, Coa, San ..... **Salvia lycioides**

6. Stems and foliage to some extent pubescent with branched hairs.

9. Calyx without branched hairs or nearly so.

10. Staminal rudder ca 5 mm long; Coa, Nue ..... **Salvia coahuilensis**
10. Staminal rudder ca 9 mm long; San ..... **Salvia macellaria**

9. Calyx densely pubescent with branched hairs.

11. Stylar shaft glabrous or nearly so; San ..... **Salvia serpyllifolia**
11. Stylar shaft pilose.

12. Leaf blades sessile or nearly so ..... **Salvia isochroma**
12. Leaf blades clearly petiolate; Coa, Hid, Pue.

13. Corollas purple; tubes 5–6 mm long; calyces 5–6 mm long; Coa ..... **Salvia jessicae**
13. Corollas blue; tubes 7–8 mm long; calyces 7–8 mm long; Hid, Pue ..... **Salvia chamaedryoides**

1. **SALVIA CEDROENSIS** Greene, Bull. Calif. Acad. Sci. 1: 212. 1885.
Baja California Sur, rocky hillsides or coastal sands, 10–400 m; flowering Mar–Apr. Map 1.

Perennial herbs or shrublets to 1 m high, pubescent with branched hairs. Leaves 2–3 cm long; blades ovate; petioles 5–15 mm long. Corollas blue; spikes with 4–6 flowers to a node. Type from Cedros Island.

2. **SALVIA CHAMAEDRYOIDES** Cav., Icones 2: 77, t 197, 1793.
Salvia chamaedrifolia Andr.
Salvia chamaedrys Willd.
Hid and Pue, oak-juniper forests, 2300–3000 m; flowering: Jun–Aug. Map 2.

Perennial suffruticose herbs 20–80 cm high. Stems pubescent with branched hairs. Leaf blades ovate to deltoid-elliptic, 6–20 mm long, 4–10 mm wide. Spikes interrupted, 5–10 cm long. Floral bracts, ovate, soon deciduous. Calyces (flowering) 7–8 mm long, the upper lip 5-veined, pubescent with branched hairs. Corolla tubes blue, 7–8 mm long; upper lips 4–5 mm long. Stylar shaft flattened, pilose apically, the upper branches 2–3 times as long as the lower.

3. **SALVIA CHIONOPHYLLA** Fernald, Proc. Amer. Acad. Arts 43: 64. 1907.
Coa, pine forests, ca 2000 m; flowering Aug–Sep. Map 2.

Sprawling, recumbent, herbs to 30 cm high. Leaves ca 2 cm long; petioles 2–5 mm long; blades ovate to elliptic. Spikes 3–6 cm long, interrupted, bearing 2–4 florets to a node. Calyces (flowering) 5–6 mm long. Corollas blue, the tubes 5–6 mm long.

This is a rarely collected species, best recognized by its sprawling habit.

4. **SALVIA COAHUILENSIS** Fernald, Proc. Amer. Acad. Arts 35: 520. 1900.
Salvia chamaedryoides var. *coahuilensis* (Fernald) K.M. Peterson
s Coa and closely adjacent Nue, mostly calcareous soils, dry brushy habitats and open pine-forests, 1200–1500 m; flowering Aug–May. Map 1.

This species is typified by material from near Parras, Coahuila. As noted by Epling (1939), it much resembles *Salvia isochroma* "but may be distinguished by the finely glandular inflorescence and usually simple hairs on the calyces."

5. **SALVIA GREGGII** A. Gray, Proc. Amer. Acad. Arts 8: 369. 1870.
Chi, Coa, Tam, Dur, Zac, San and closely adjacent USA, mostly dry calcareous soils of the Chihuahuan Desert region, 500–2600 m; flowering all seasons, depending upon rain. Map 3.
Suffruticose herbs or shrublets to 60 cm high; corollas red to purplish-red, the tubes 15–25 mm long.

This is a widespread, very common, species, commonly grown as an ornamental in the USA and Mexico. It presumably hybridizes with related taxa, to judge from some of the accounts herein (see *Salvia macellaria*).

6. **SALVIA ISOCHROMA** (Fernald) B.L. Turner, **comb. et stat. nov.** *Salvia chamaedryoides* var. *isochroma* Fernald, Proc. Amer. Acad. Arts 35: 522. 1900.
s Nue, Zac, and San, shrub-oak woodlands, limestone plains and hills, 2000–2300 m; flowering Jul–Sep. Map 2.

This species is closely related to *S. chamaedryoides* and is treated as a variety of that taxon by Fernald. Epling (1939) noted that it was "Apparently a form of more arid habitat; perhaps distinct." In addition to characters noted in the key above, the flowers of *S. isochroma* appear to be consistently smaller.

7. **SALVIA JESSICAE** B.L. Turner, **sp. nov. TYPE: MEXICO. Coahuila.** Mpio. Francisco 1 Madero: West side of Valle de Buenavista, gypsum hillside, 1765 m, 21 Sep 2012, *Hinton et al. 29359* (holotype: MEXU; isotypes: GBH, LL-TEX). Fig. 1, Map 2.

Resembling *S. chamaedryoides* Cav. but the stems markedly woody at base (vs lignescent), leaves larger (2–3 cm long, vs. 1–2 cm), corollas purple (vs blue), and calyces 5–6 mm long (vs 7–8 mm).

Perennial herbs or shrublets, to 80 cm high. **Older stems,** decidedly woody; newly emerged stems pubescent with branched white hairs, the vestiture ca 0.3 mm high. **Leaves** (mid-stem), ovate-lanceolate, 2–3 cm long; petioles 3–10 mm long; blades pubescent above and below with branched hairs, more so beneath, the margins entire. **Inflorescence** a terminal interrupted spike 5–10 cm long, pubescent, like the stems. **Flowers** 1–2 at a node, the bracts minute, soon deciduous. **Pedicels** 1–2 mm long. **Calyces** 5–6 mm long, 2-lipped, pubescent like the stems, the mouth with 5,

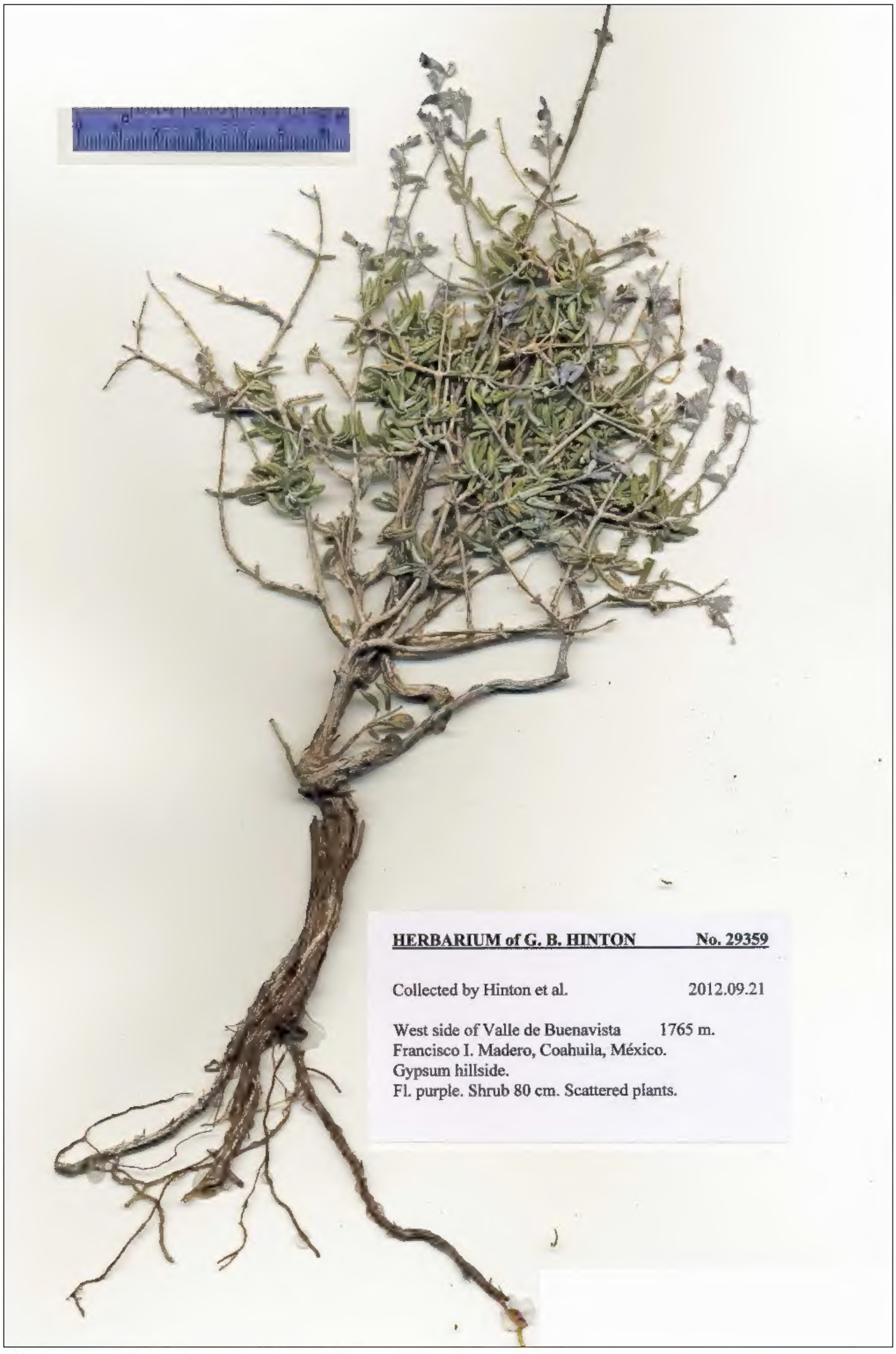

HERBARIUM of G. B. HINTON No. 29359
Collected by Hinton et al. 2012.09.21
West side of Valle de Buenavista 1765 m.
Francisco I. Madero, Coahuila, México.
Gypsum hillside.
Fl. purple. Shrub 80 cm. Scattered plants.

Figure 1. *Salvia jessicae* B.L. Turner (isotype).

Figure 2. *Salvia jessicae* in the field.

apiculate lobes ca 1 mm long; upper lip 5–7 veined. **Corolla** purple, 2-lipped; tubes 4–5 mm long, glabrous within; upper lip 3 mm long; lower lip 2.5 mm long. **Stamens** attached at the mouth of the tube; anthers purple, ca 1.2 mm long. **Styles** ca 10 mm long; shafts pubescent throughout with trichomes ca 0.5 mm long; branches purple, recurved, the upper branches ca. twice as long as the lower. **Nutlets** unknown (immature).

So far as known, this species is the only obligate gypsophile found within the sect. *Flocculosae*. It co-occurs with another, as yet undescribed gypsophile closely related to *Gaillardia candelaria* (B.L. Turner in prep.).

The novelty is named for the daughter (Jessica Hinton, Fig. 3) of George Hinton, grandson of the legendary botanical lineage established by George B. Hinton (1882–1943), this expanded upon in more detail by Hinton and Rzedowski (1972).

Figure 3. Jessica Hinton, age 14.

8. **SALVIA LYCIOIDES** A. Gray, Proc. Amer. Acad. Arts 21: 408. 1886.
Salvia ramosissima Fernald

Chi, Coa, Nue, Dur, San, and closely adjacent USA (Texas), calcareous soils in desert scrublands, 1800–3200 m; flowering Aug–Oct. Map 4.

Suffruticose herbs, or subshrubs to 50 cm high. Leaves 1–3 cm long; petioles 2–5 mm long; blades oval to elliptic-ovate, glandular-punctate, pubescent with simple hairs. Spikes interrupted, 5–10 cm long, the rachis pubescent with simple, glandular or eglandular, hair. Corollas "blue-lavender," or dark blue, the tubes 9–11 mm long.

This is a relatively common species of the Chihuahuan desert regions, closely related to *Salvia muelleri* but distinct in having larger, more nearly ovate, leaves, and smaller flowers. Putative hybrids between *S. lycioides* and S. *macellaria* in Dur (LL-TEX), so proposed by the late K.M. Peterson (by annotation), appear to be specimens of *S. muelleri* but have smaller flowers with pubescent stylar shafts. I have mapped these as part of *S. muelleri* but the plants are perhaps best treated as aberrant individuals of *S. lycioides*. The complex is in much need of additional study, especially in the field.

9. **SALVIA MACELLARIA** Epling, Repert. Spec. Nov. Regni Veg. Beih. 110: 162. 1939.

San, vicinity of San Luis Potosí, dry oak shrublands, 2000–2400 m; flowering Aug–Sep. Map 1.

Perennial suffruticose herbs or shrublets, 20–50 cm high; leaves broadly ovate to subdeltoid; corollas "magenta" or purplish-red, much resembling *Salvia muelleri*, as noted below.

Epling noted in his original description that "This proposed species suggests strongly a hybrid between two such forms as *S. Greggii* (sic) and *S. chamaedryoides*." Which might well be the case, but the two taxa do not appear to co-occur at the present time, suggesting that hybridization is unlikely. For additional comments involving possible hybrid taxa, see below.

10. **SALVIA MUELLERI** Epling, Repert. Spec. Nov. Regni Veg. Beih. 110: 163. 1939.

Coa, Nue, and Dur?, pine-oak chaparral of Chihuahuan desert regions,1500–2200 m; flowering Jul–Sep. Map 1.

Closely related to *Salvia lycioides* but readily distinguished by foliage, flower size, and glabrous stylar shafts. Type material was collected from the area of Monterrey, Nuevo León. Recent collections from the Sierra del Carmen in northern Coahuila (LL-TEX) having very large corollas might represent an undescribed taxon. The collections of *S. muelleri* mapped from Durango are discussed under *Salvia lycioides*, above.

11. **SALVIA SERPYLLIFOLIA** Fernald, Proc. Amer. Acad. Arts 354: 521. 1900.

San, dry brushlands, 2000–2400 m; flowering Jul–Aug. Map 5.

Suffruticose herbs to 60 cm high. A rarely collected species, much resembling *Salvia chamaedryoides* but the pubescence simple, not of branched hairs.

12. **SALVIA THYMOIDES** Benth., Lab. Gen et Sp. 255. 1833.

Pue and Oax, dry shrubby hillsides, 2000–2500 m; flowering Jul–Sep. Map 5.

Perennial suffruticose herbs, 20–60 cm high; easily recognized from related taxa by its small leaves and glandular calyces.

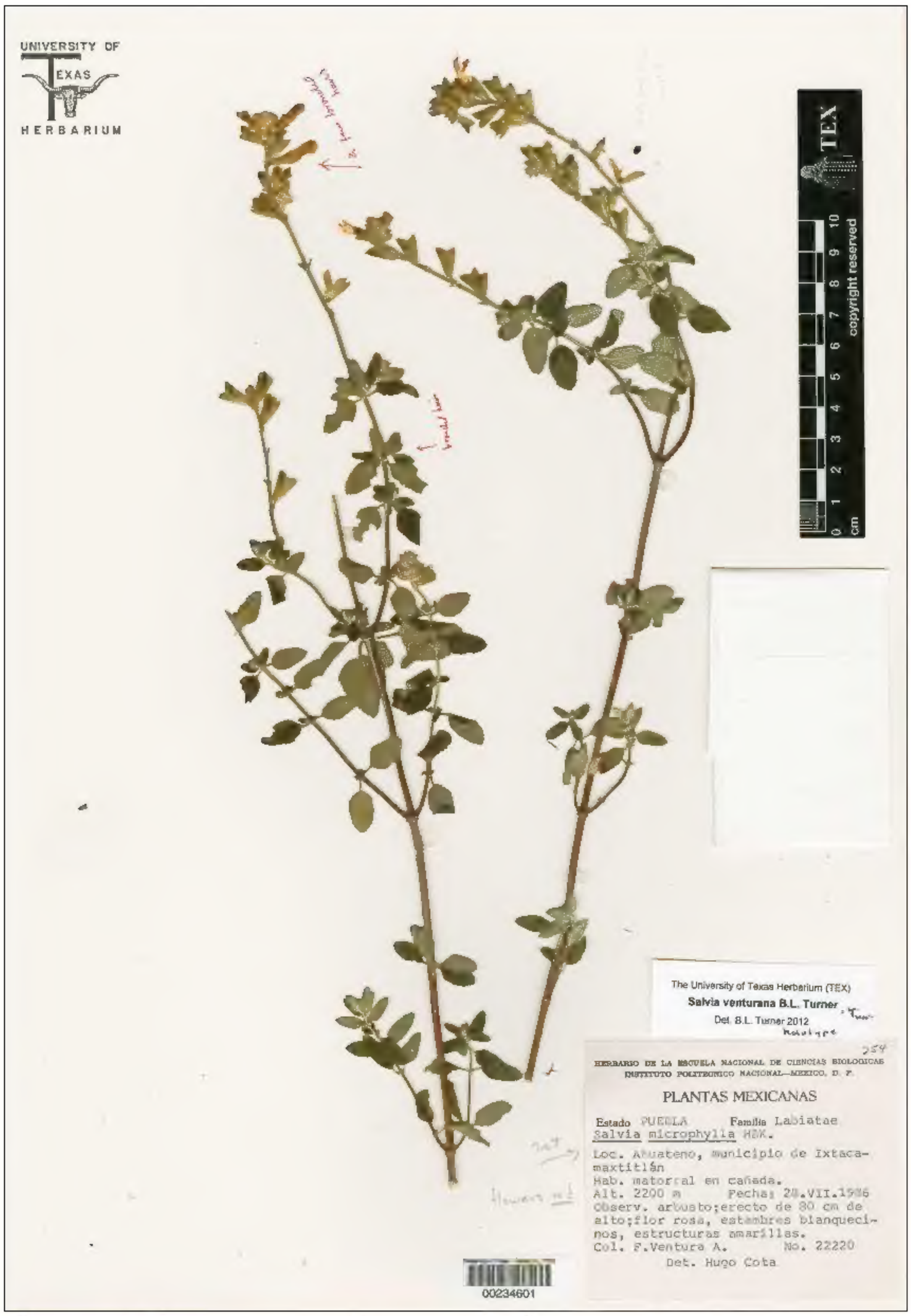
13. **SALVIA VENTURANA** B.L. Turner, **sp. nov. TYPE: MEXICO. Puebla.** Mpio. de Ixtacamaxtitlan: Ahuateno, mattorral en canada, 2299 m, 28 Jul 1986, *F. Ventura A. 22220* (holotype: TEX). Map 3

Resembling *Salvia greggii* A. Gray but the pubescence mostly of branched hairs (vs simple), the upper leaf surfaces rugose (vs smooth and markedly glandular-punctate), and their margins crenulate (vs entire or nearly so).

Suffruticose herbs or shrublets to 80 cm high. **Mid-stems** pubescent with short, white, branched trichomes ca 0.3 mm high. **Leaves** 2–3 cm long, 0.5–2.0 cm wide; petioles 3–10 mm long; blades ovate, elliptic to subdeltoid, the lower surfaces densely pubescent with branched trichomes, upper surfaces bullate, sparsely pubescent with branched hairs, the margins crenulate. **Spikes** interrupted, 6–10 cm long, the rachis pubescent with branched hairs, beneath these an array of short amber globules. **Floral bracts**, broadly obovate, soon deciduous. Flowers 2–4 to a node, the pedicels 2–3 mm long. **Calyces** (flowering) 7–8 mm long, pubescent with both branched and simple hairs, the upper lip 7-veined. **Corollas** red or "rosa," 1.5–2.5 cm long; tubes 10–15 mm long; upper lip ca 5 mm long, about equal to the lower lip in length. **Stylar shaft** flattened, pilose apically, the

upper branches 2–3 times as long as the lower, flattened-acicular, branches. **Nutlets** dark brown, glossy, ca 3 mm long, 2 mm wide.

This is a very distinctive member of sect. *Flocculosae*. The type collection (*Ventura 22220*) was initially identified as *Salvia microphylla* Kunth, which it superficially resembles. The species is named for the collector, Francisco Ventura Aburto, professor-investigator in the Departamento de Geografía de la Universidad de Guadalajara. Ventura has been a prolific collector and student of Mexican plants and biogeography and was recognized in 2008 as one of the five most important botanical collectors of Mexico (see Plata 2008).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Salvia venturana B.L. Turner
Det. B.L. Turner 2012
HERBARIO DE LA ESCUELA NACIONAL DE CIENCIAS BIOLOGICAS
INSTITUTO POLITECNICO NACIONAL—MEXICO, D. F.
PLANTAS MEXICANAS
Estado PUEBLA Familia Labiatae
Salvia microphylla HBK.
Loc. Ahuateno, municipio de Ixtacamaxtitlán
Hab. matorral en cañada.
Alt. 2200 m Fecha: 28.VII.1986
Observ. arbusto;erecto de 80 cm de alto;flor rosa, estambres blanquecinos, estructuras amarillas.
Col. F.Ventura A. No. 22220
Det. Hugo Cota
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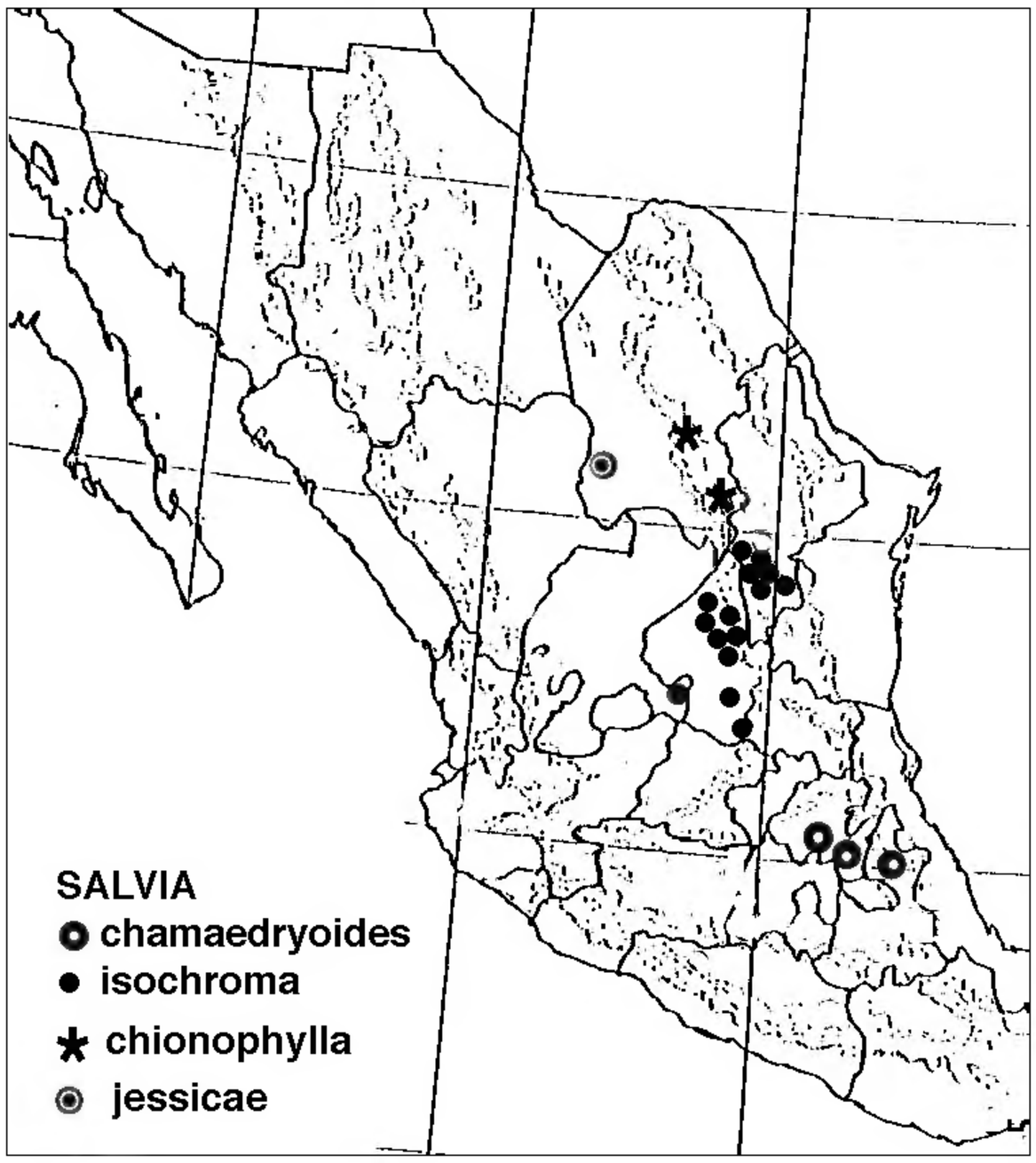
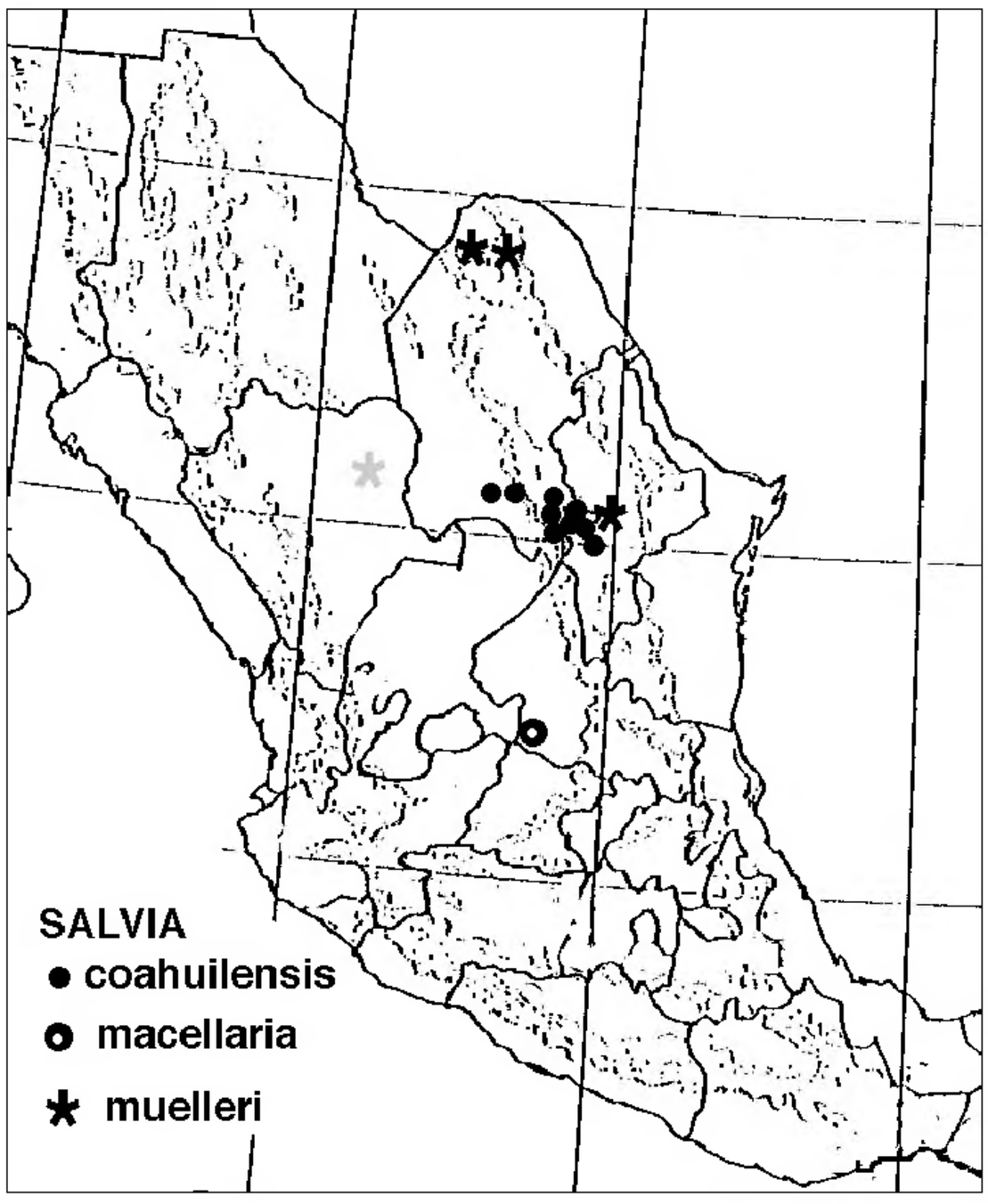
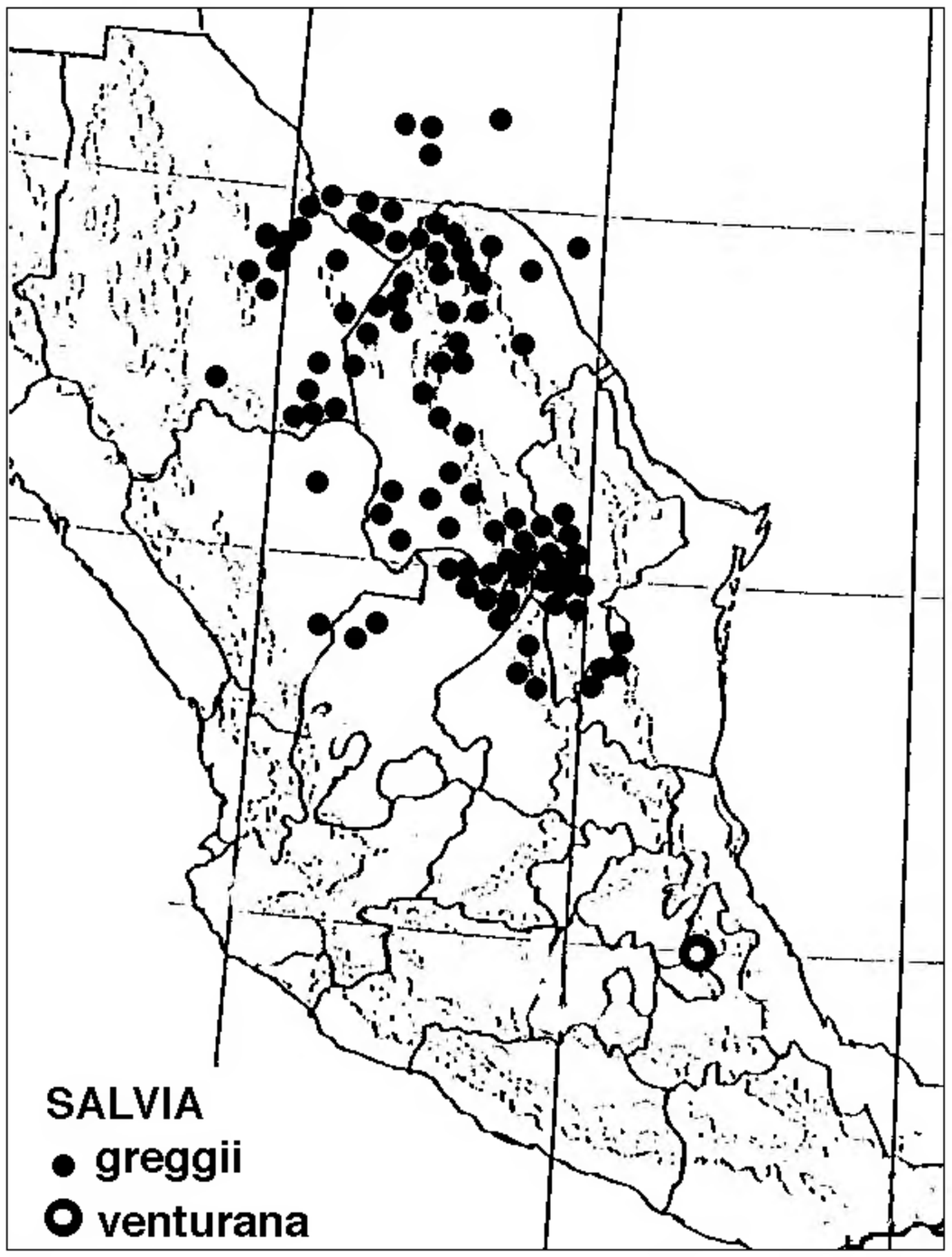
Figure 4. *Salvia venturana* B.L. Turner (holotype)


SALVIA
chamaedryoides
isochroma
chionophylla
jessicae

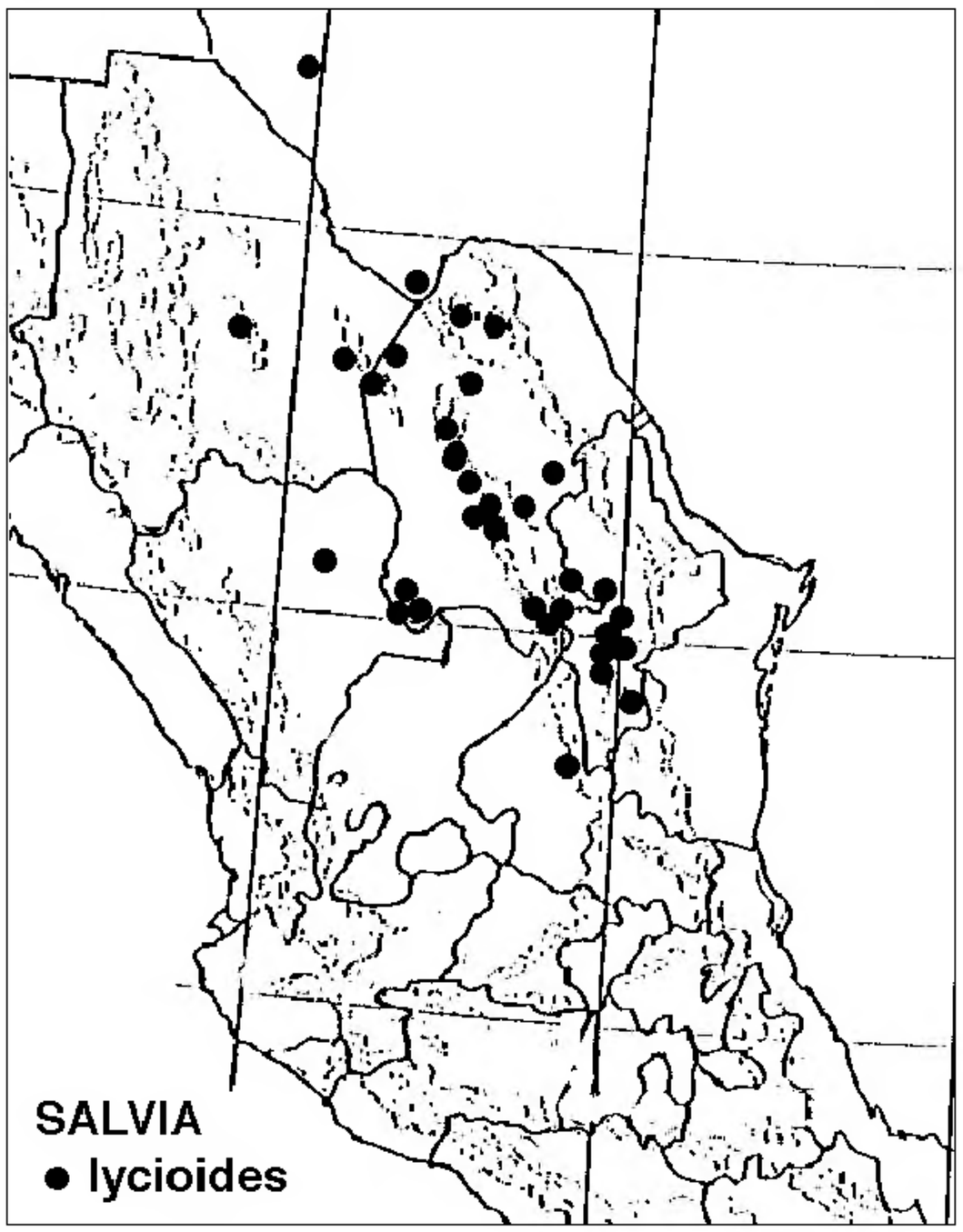
Map 1.


SALVIA
coahuilensis
macellaria
muelleri

Map 2.



Map 3.



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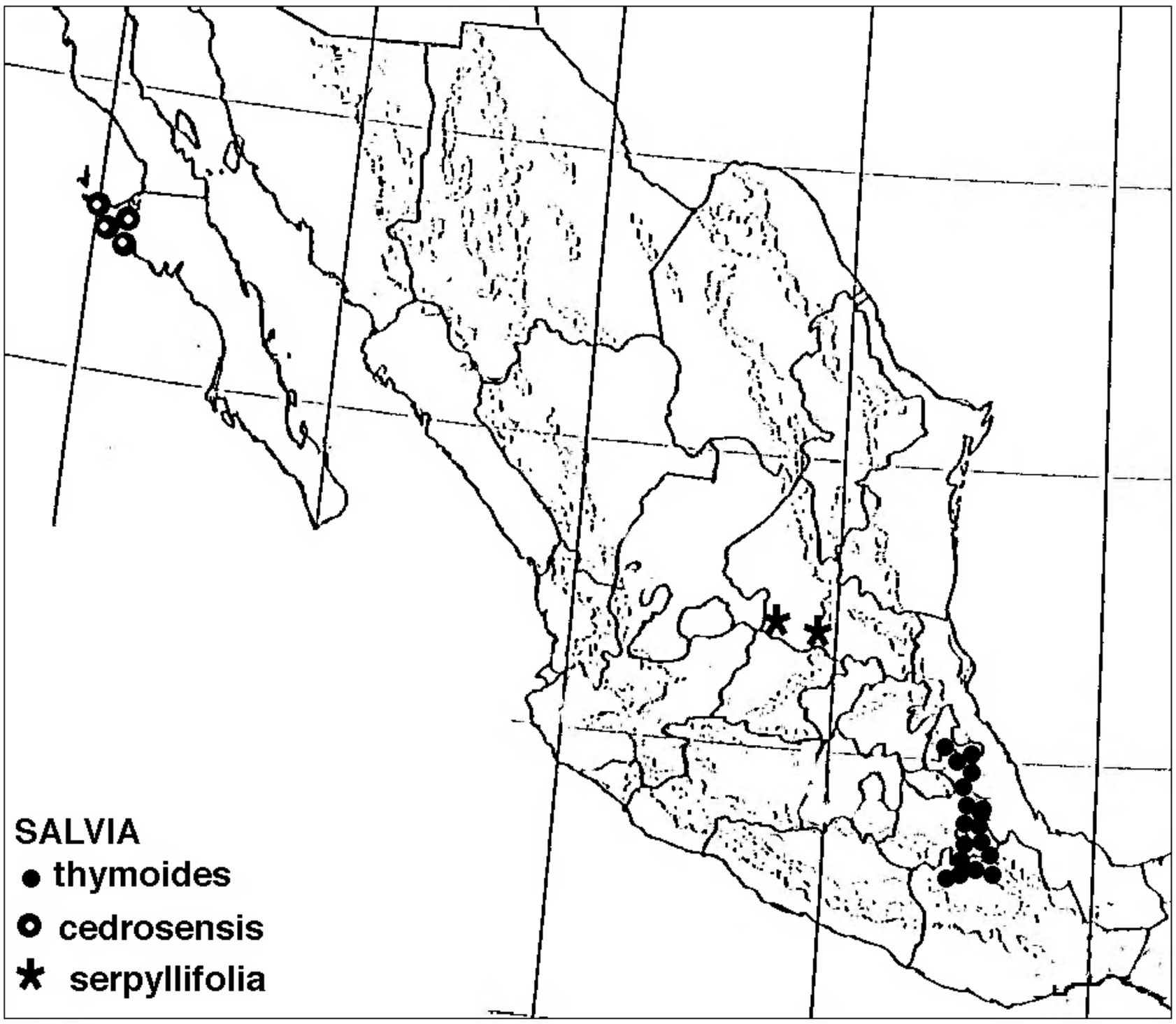

Map 5.

ACKNOWLEDGEMENTS

Thanks to George Hinton for calling my attention to *Salvia jessicae*. George also provided pictures of the isotype and field specimens and that of his daughter Jessica. Jana Kos provided editorial assistance. Maps showing distribution are mostly based upon specimens on file at LL-TEX.

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